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EXAMINER	
LE, MIRANDA	

ART UNIT	PAPER NUMBER
2177	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/871,484	Applicant(s) GHUKASYAN, HOVHANNES	
	Examiner Miranda Le	Art Unit 2177	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to Amendment A, filed 03/19/2004.

2. Claims 1-8 are pending in this application. Claim 1 is independent claims. In the Amendment A, no claims have been amended. This action is made Final.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindsay et al. (US Patent No. 6,105,020), in view of Miura et al. (US Patent No. 6,052,687).

As per claim 1, Lindsay teaches " method for automatic generation of join graphs for relational database queries (Figs. 2, 6, col. 5, line 63 to col. 6, line 8), comprising: (a) receiving an input list of tables including attributes of interest for a database query" at col. 5, line 63 to col. 6, line 8;

"(e) generating a join graph corresponding to said input list of tables from said marked instances in said hierarchical representation" Figs. 2, 6, col. 5, line 63 to col. 6, line 67, col. 7, lines 1-17.

Lindsay does not specifically teach the following limitations. However, Miura teaches:

"(b) marking instances of tables of said input list having single occurrences in an hierarchical representation of a database schema, and marking ancestors of said instances of tables according to said hierarchical representation" at col. 7, lines 48-65;

"(c) marking unmarked instances of multidimensional tables of said input list closest to marked instances, marking unmarked ancestors of said unmarked instances of said multi-dimensional tables according to said hierarchical representation, and marking unmarked instances of one-dimensional tables that reference said multidimensional tables and have said unmarked instances of said multi-dimensional tables as parents according to said hierarchical representation" at col. 7, lines 48-67, col. 8, lines 1-67, col. 9, lines 1-44, Figs. 7, 10, 12;

"(d) marking unmarked instances of one-dimensional tables of said list of tables closest to marked instances, and marking unmarked ancestors of said unmarked instances of said one-dimensional tables according to said hierarchical representation" at col. 7, line 48 to col. 8, line 11.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Lindsay with the teachings of Miura to include steps (b), (c), (d) in order to provide a relational database search system capable of obtaining a

desired retrieval result even when a user does not fully understand the table structure and the filed information in the relational database, as taught by Miura at col. 41-47.

As per claim 2, Lindsay teaches "(bl) selecting a table of said input list" at col. 7, lines 5-46, Fig. 4.

Linsay does not explicitly teach the following limitations. Miura teaches:

"(b2) determining whether a number of instances of said table in an hierarchical representation of a database schema is greater than one" at col. 8, lines 30-56, Fig. 7;

"(b3) if said number of instances of said table is not greater than one, then marking an instance of said table in said hierarchical representation arid all unmarked instances of ancestor tables to said table according to said hierarchical representation" at col. 8, lines 30-56, Fig. 7;

"(b4) repeating (b1) to (b3) until a last table in said input list is processed" at col. 8, lines 12-56, col. 9, lines 1-44, Fig. 7.

As per claim 3, Miura teaches "(b5) selecting a table having a table name from said input list" at col. 6, lines 30-67, Fig. 5;

"(b6) determining whether a number of dimensions of said table is greater than one according to a database schema" at col. 7, line 41 to col. 8, line 67;

"(b7) if said number of dimensions of said table is greater than one, then adding said table name to a multidimensional list of table, and if said number of dimensions of said table is not greater than one, then adding said table name to a one-dimensional list of tables" at col. 7, line 41 to col. 8, line 67, col. 9, lines 1-65, Fig. 7;

"(b8) repeating (b5) to (b7) until a last table in said input list is processed" at col. 7, line 41 to col. 8, line 11, Fig. 7.

As per claim 4, Miura teaches "(bl) selecting a table having a table name from said input list" at col. 6, lines 30-67, Fig. 5;

"(b2) determining whether a number of instances of said table in an hierarchical representation of a database schema is one" at col. 7, line 41 to col. 8, line 67;

"(b3) if said number of instances of said table is one, then marking an instance of said table in said hierarchical representation and all unmarked instances of ancestor tables to said table according to said hierarchical representation" at col. 7, line 41 to col. 8, line 67;

"(b4) if said number of instances of said table is greater than one, then determining whether a number of dimensions of said table is greater than one according to a database schema" at col. 7, line 41 to col. 8, line 67, col. 9, lines 1-65, Fig. 12;

"(b5) if said number of dimensions of said table is greater than one, then adding said table name to a multidimensional list of tables, and if said number of dimensions of said table is not greater than one, then adding said table name to a one-dimensional list of tables" at col. 7, line 41 to col. 8, line 67, col. 9, lines 1-65;

"(b6) repeating (bl) to (b5) for all tables in said input list" at col. 7, line 41 to col. 8, line 67, col. 9, line 1 to col. 10, lines 44, Figs. 7-12.

As per claim 5, Miura teaches "(cl) selecting a multi-dimensional table from said multi-dimensional list" at col. 8, line 67 to col. 9, line 65;

"(c2) if an instance of said. multi-dimensional table has been marked in said hierarchical representation, then selecting another mufti-dimensional table from said mufti-dimensional list" at col. 8, line 67 to col. 9, line 65;

"(c3) if an instance of said mufti-dimensional table has not been marked in said hierarchical representation, then finding an instance of said multidimensional table that is a closest child in relationship to a marked instance in said hierarchical representation" at col. 8, line 67 to col. 9, line 65;

"(c4) marking said found instance of said multidimensional table and instances of all unmarked ancestors of said found instance of said mufti-dimensional table according to said hierarchical representation" at col. 9, line 6 to col. 10, line 67, col. 11, lines 1-56;

"(c5) generating a dimensions list for said multidimensional table" at col. 8, lines 11-54;

"(c6) processing said dimensions list" at col. 7, lines 48-65, col. 8, lines 11-54;

"(c7) repeating (cl) to (c6) until a last table in said mufti-dimensional list is processed" at col. 7, lines 48-65.

As per claim 6, Miura teaches "said (c5) comprises referring to a database schema to determine all reference tables to said mufti-dimensional table, and including all said reference tables except a parent of said mufti-dimensional table according to said hierarchical representation" at col. 8, line 67 to col. 9, line 67, col. 10, line 1 to col. 11, line 56.

As per claim 7, Miura teaches "(c61) selecting a reference table from said dimensions list" at col. 7, lines 48-65;

"(c62) if a table name of said reference table is not in said one-dimensional list, then selecting another reference table from said dimensions list" at col. 7, line 48 to col. 8, line 54;

"(c63) if said table name of said reference table is in said one-dimensional. list, then marking an instance of said reference table in said hierarchical representation having said current multi--dimensional table as its parent" at col. 8, line 12 to col. 9, line 67, col. 10, lines 1-24;

"(c64) removing said table name from said one-dimensional list" at col. 7, line 48 to col. 8, line 54, Fig. 7;

"(c65) repeating (c61) to (c64) until a last reference table in said dimensions list has been processed" at col. 7, lines 48-65, col. 8, lines 1-11, Fig. 7.

As per claim 8, Miura teaches "(dl) selecting a one-dimensional table from said one-dimensional list" at col. 8, lines 22-56, col. 9, lines 6-65;

"(d2) if an instance of said one-dimensional table has been marked in said hierarchical representation, then selecting another one-dimensional table from said one dimensional list" at col. 8, line 22 to col. 9, line 67, col. 10, lines 1-54;

"(d3) if an instance of said one-dimensional table has not been marked in said hierarchical representation, then finding an instance of said one-dimensional table that is a closest child in relationship to a marked instance in said hierarchical representation" at col. 7, lines 48-65, col. 9, lines 6-65;

"(d4) marking said found instance of said one-dimensional table and instances of all unmarked ancestors of said found instance of said one-dimensional table according to said hierarchical representation" at col. 7, lines 48-65, col. 9, line 1 to col. 10, line 67, col. 11, lines 1-55;

"(d5) repeating (dl) to (d4) until a last one-dimensional table in said one-dimensional list is processed" at col. 7, lines 48-65, col. 8, lines 22-67, col. 9, line 1 to col. 10, line 54.

Response to Arguments

5. Applicant's arguments filed 03/19/2004 have been fully considered but they are not persuasive.

Applicant argues that:

(a) Miura does not show the path in a hierarchical representation of a relational database.

(b) Miura does not provide a method for marking particular table for generating a join graph.

(c) Miura does not teach the marking a single occurrence table and all ancestors of the table.

(d), Miura does not teach marking a multidimensional table and marking of one dimensional table that reference the multidimensional table.

Per (e), neither Linsay nor Miura teaches these limitations, and even if the Miura teaches all of the limitations, the examiner has not provided a proper motivation to combine.

The Examiner respectfully disagrees for the following reasons:

Per (a), Miura does show the path in a hierarchical representation of a relational database. According to the specification at [0040], "the hierarchical representation of a relational database" is represented as the table name relationship in the relational database. The table name WAFER has one ancestor is table LOT ([0041]). Similarly, Miura discloses the relational database with a hierarchical representation (col. 6, lines 31-49), table TECT is an ancestor of table IPPANT, table SOURCET, and table MARKER.

Per (b), Miura does not provide a method for marking particular table for generating a join graph.

Applicant invention is directed to a method for automatic generation of join graphs for relational database queries that *requires no special knowledge of the database schema or the relationship between tables in the database by a user initiating a query of the database* ([0004]). Based on the user's query, the system having the method to build the relational database language query by generating the join graph ([0030]), the join condition discloses the link between the table ([0030]), the term "marking a table" that the applicant discloses in [0020] is hence understood as "selecting a table" for linking to build the relational database language query. Analogously, Miura invention is directed to a system and method in relational database for retrieving a result *when a user does not fully understand the table structure and the field information in the relational database* (Abstract). Miura teaches the step of selecting table (i.e. marking a table) for generating an SQL statement according to a user query at col. 5, lines 3-11. Miura also shows an example of selecting table for linking at col. 6, lines 31-67, and Fig. 5. It should be

noted that in SQL, when a relationships exist between tables they can be linked together in queries, and two tables can be joined when each contains a column that shares a common domain with the other (Miura, col. 6, lines 51-67). Further, the WHERE clause of the SELECT command is used for multiple table operations, and SQL specifies a join implicitly by referring in a WHERE clause to the matching of common columns over which tables are joined (Miura, col. 11, lines 1-6).

Per (c), Miura teaches marking (selecting) a single occurrence table and all ancestors of the table at col. 6, lines 34-49. The term "marking" is understood as "selecting" the table for generating the query statement in the relational database for retrieving desired information.

Per (d), Miura teaches marking a multidimensional table and marking of one dimensional table that reference the multidimensional table at col. 9, lines 45-65, Fig. 13. The multidimensional table corresponds to the intermediate link table in Fig. 13. The one-dimensional tables are selected (i.e. marked) correspond to table TECT & IPPANT, as example if making a link from TECT table to IPPANT table. It should be noted that the intermediate link table is a multidimensional table (i.e. ZUB is one-dimension of the table TECT).

Per (e), as discussed, Linsay had already shown generating a join graph representing the query, with the join graph including nodes representing tables and edges between at least some nodes representing query predicates (col. 3, lines 24-27), and

determining a selectivity of query predicates corresponding to edges of a join graph representing the query (col. 3, lines 38-40), hence the Miura reference is combined to show how to mark particular tables to generate a join graph. As pointed out by the examiner, the teaching of marking particular tables for generating a join graph by Miura is used in combining with the system of Linsay to render obvious the claimed limitations.

Furthermore, Applicant's arguments seem to be suggesting that there is no suggestion to combine the references. In response to the preceding arguments, the Examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, a method for performing relational database queries and for automatic generation of join graphs of the present invention reads on Linsay's teaching of generating a join graph representative of the query, and the join graph includes data tables and query predicates therebetween. Linsay teaches generating a join graph (or join tree) corresponding to input list of tables from marked instances in hierarchical representation (col. 5, line 63 to col. 6, line 31, Figs. 2-6), but does not expressly teach steps (b), (c), (d). However, Miura teaches marking each and every table needed to generate a join graph at col. 7, lines 48-67, col. 8, lines 1-67, col. 9, lines 1-44, Figs. 7, 10, 12.

Both Linsay and Miura teach the same field as retrieving the information in the relational database and query optimization, hence, the combination of Linsay and Miura

would arrive at claim 1 of the present invention since Miura's teaching of automatically generating a structure query language (SQL) statement according to the minimal input information using the intermediate link table (Miura, col. 2, lines 41-45) so that an optimum SQL retrieval can be performed without knowledge about the table structure (Miura, col. 9, lines 61-65) would allow users of Lindsay's system to improve the performance of the system by minimizing the number of fact table pages that must be read from disk (i.e. to identify the minimal set of tables necessary to execute the join graph, col. 3, lines 37-40), (Linsay, col. 1, lines 61-63).

Applicant has made a piecemeal analysis of the references. Applicant is therefore reminded that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Accordingly, the claimed invention as represented in the claims does not represent a patentable over the art of record.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (703) 305-3203. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene, can be reached on (703) 305-9790. The fax number to this Art Unit is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Miranda Le
May 26, 2004

GRETA ROBINSON
PRIMARY EXAMINER